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THE PLANT DISEASE REPORTER

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THE PLANT DISEASE SURVEY

OFFICE OF MYCOLOGY AND DISEASE SURVEY

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BEAN DISEASES IN WESTERN UNITED STATES IN 1930*

By W. J. Zaumeyer, Associate Pathologist, Bureau of Plant Industry.

The writer issued a report on the diseases of the bean (Phaseolus vulgaris) in western United States in 1929 in the Plant Disease Reporter, volume 14, number 5, March 1, 1930. It is the purpose of this report to follow the same general plan as in 1929, including observations on the presence or absence of the several diseases as observed in most of the large western bean-producing sections during the past summer. The observations made not only include the snap or garden bean varieties, but also the field (P. vulgaris) and lima (P. lunatus) beans as well.

The survey was made during July, August, and September, covering examinations of fields in Colorado, Utah, Wyoming, Montana, Idaho, and California. As in 1929, the survey did not include all portions of the states, but only those where the bean-growing industry was of special importance. Similarly not all fields in a locality were inspected; however, a representative number was examined and the report is based on observations made in a total of 312 fields of garden and field beans and 52 of lima beans.

The writer wishes to express his thanks to the seedsmen in the various localities where the inspections were made for the excellent cooperation and assistance they gave, since it was through their combined efforts that it was possible to complete fully this survey.

Colorado

In Colorado the survey was conducted in Weld, Morgan, and Pueblo Counties, where several seed companies maintain large acreages. In Pueblo County a considerable acreage of lima beans was surveyed besides

*Mr. Charles Henderson, Assistant Entomologist of the U. S. Department of Agriculture was a collaborator on the report dealing with the curly top of beans in Idaho. Careful examinations in 52 fields were made by him and a complete report of his findings is recorded here under diseases in Idaho.

that of garden beans. In Weld and Morgan Counties large plantings of the Pinto bean, a field variety, were examined and the observations on all will be recorded.

Bacterial blight (Bacterium phaseoli or B. medicaginis var. phaseolicola). This disease was observed to a very limited extent in the Greeley section (Weld County). In the 70 bean fields visited, bacterial blight was observed in only 10, and in most instances was causing a very slight reduction in stand and yield. In practically every case infection was observed on the seedlings at the cotyledonary node indicating seed infection. The majority of the infected seedlings died, resulting in almost no secondary spread. Some little spread was noted after August 15, due to higher humidities which prevailed for about a week previous to that time. Since this spread took place at a time when the beans were quite well developed, far less damage resulted than if the dissemination had occurred at an earlier date.

When bacterial blight infection was noted, the seed source could almost inevitably be traced to Colorado-grown seed. There was a considerably smaller amount of the disease noted in 1929 than in 1928, and as a result the infection noted in 1930 from seed originating in Colorado in 1929 was less than it has been in the past few years. The reduction in blight infection in 1929 and 1930 can be accounted for by the use of blight-free seed from southern Idaho, and by the low humidities and high temperatures that prevailed at the time when the beans were in a susceptible stage. The latter is particularly true of the past season, and as a result most of the beans grown in the Greeley section this year will carry an extremely small amount of infected seed.

In Morgan County, considerably more bacterial blight was observed. The seed source for many plantings in this section was identical with that of the Greeley fields, but, as the humidities were higher in Morgan County at the time when the beans were in a susceptible stage, considerable spread and development of the disease and a consequent reduction in yield resulted. Eighteen representative plantings of the section were inspected, 13 of them showing blight infection ranging from 2 to 90 per cent, showing the disease in varying degrees. In many instances blight lesions were noted on the pods.

Information received from the seedsmen was that there were no signs of the disease previous to August 1. There were three rains from August 1 to 4, and rains also on August 9 and 10. This precipitation was probably responsible for the spread and development of the blight noted in the inspection. Since the spread took place at a time when the plants were quite well developed, the reduction in yield was far less than if the disease had spread earlier in the season.

In Pueblo County less garden-bean acreage was found than in the Greeley section; however, a number of fields were visited and the amount of blight recorded. Unfortunately, in this territory considerable home-grown seed is used from year to year, and whenever such plantings were inspected, a considerably higher percentage of blight was found than in those fields for which contracts had been let by the seed firms.

Practically all of the garden-bean seed grown in the Western States is contracted by seedsmen. The seed stock is furnished to the farmers by the respective companies and considerable attention is paid to such seed, especially from the standpoint of freedom from disease. Occasionally certain growers obtain garden-bean seed from one source or another and grow it without contracting it with a seed firm. Such seed is often grown in the same section year after year with little attention being paid to it, either in regard to varietal type or to freedom from disease, thus building up a strain not only very variable as to type, but also with a large amount of bacterial blight.

Wherever plantings of this "Wild Cat" seed, as it is known to the seedsmen, were inspected, higher percentages of bacterial blight were noted than in contract fields of the same variety.

Thirteen fields, selected as representative, were examined of which four were "Wild Cat" and the remainder the regular contract stock. In two of the nine fields of contract beans, traces of bacterial blight were observed, causing a very small reduction in yield. Two of the four fields of "Wild Cat" beans showed high percentages of infection, one as high as 50 per cent with a great reduction in stand and yield. The other two fields had smaller amounts of the disease.

The Pueblo section is the only one in Colorado where the lima bean is grown extensively. Inspections were made in sixteen fields of which four were planted with 1929 California seed, and twelve from Colorado seed of the same year.

The amount of bacterial blight (Bacterium vignae) observed was small. It was noted that no blight was found in fields planted with the California seed, whereas there was a small amount in fields from Colorado seed. The first examinations were made about August 1, and the lesions were found only on the leaves and then only in restricted areas of the field. In an examination of these same fields two weeks later, the organism had become slightly more disseminated than it had on August 1, and the lesions could be found on the pods. A still later examination showed that the reduction in yield because of the blight was very small.

Anthracnose (Colletotrichum lindemuthianum). Anthracnose was not observed in any of the commercial bean fields examined. A trace of the disease was found, however, in the trial plots at Greeley. A number of lots of bean seed, which had originated in Wisconsin in 1929, and which were infected then with the disease, were planted in the Greeley trial grounds the past season. The disease was not observed in these lots up to August 15, but the initial lesions must have been overlooked since infection was noted on a few plants about the middle of September. It is believed that if the low humidities which prevailed in the early part of the summer had continued, the organism would have disappeared, but with the rains which occurred from August 12 to August 18, the humidities were sufficiently high for the development of the organism. From June 2 to August 12, there were only 2.71 inches of rainfall, whereas from August 12 to August 18, there were 4.15 inches of rain.

Even though eastern-grown seed was planted in commercial fields, no anthracnose was noted. In fact, the disease has not been reported from the state in the past ten years and it is unlikely that it will be of serious consequence.

Pythium wilt (Pythium butleri). An interesting observation was made with reference to this disease in four fields of beans located in the Greeley section in close proximity to each other. The beans at the time the observation was made were from 12 to 14 inches in height and were beginning to bloom. The field in which the infection was most severe was planted to the Late Stringless Green Refugee variety. Four or five days previous to the time the disease was observed the beans had been irrigated for 24 hours, and a portion of the field had become flooded, although for only a short period. Extremely warm weather followed. The disease was more severe in the flooded part, averaging 10 to 12 per cent, but was found in small percentages throughout the remainder of the field. The wilting occurred from July 12 to 19 and the plants were often found dying in groups of from 2 to 5 plants, but never all of them in the row.

Mosaic (virus). A careful survey for this disease was made in the Greeley section on the Green Refugee variety, one which is very susceptible to the disease and which is grown extensively there. Twenty-five fields of this variety were examined weekly during the greater part of the growing season, and at the time when the last observations were made the amount of disease ranged from 8 to 67 per cent, depending upon the location of the field.

The low percentages of the disease found in the early part of the season apparently resulted from seed infection, and the higher percentages recorded later in the summer were due to secondary spread of the virus. Although stunting was observed in some of the primary-infected seedlings, little if any was noted on the plants secondarily infected.

In a field of Great Northern beans, a variety not grown extensively in Colorado, a high percentage of mosaic was recorded causing a very decided reduction in yield.

In Morgan County, three fields of the Late Stringless Green Refugee variety were inspected August 15 and the percentage of plants infected with mosaic ranged from 60 to 98 per cent in these fields. According to a seedsman's report, the crop appeared to be in excellent condition in the early part of the season, but the infection had later spread rapidly until a very high percentage of the plants were affected. In the field where 98 per cent of the plants were infected almost all were severely stunted, and it was believed at that time that these plants would not produce as much seed as had been planted. After that time, weather favorable for plant growth and unfavorable for mosaic development prevailed, and the crop produced an average yield. Other varieties in a field of the Bountiful variety of southern Idaho origin in 1929 showed a high percentage of the disease causing a chlorotic effect on the plants, but no stunting or yield reduction. The disease was of little importance in most of the other varieties observed.

Root rots (Fusarium and Rhizoctonia spp.) The root rots, as in 1929, caused no appreciable reduction in stand or yield in any of the plantings examined even though diseased plants could be found in every field. In two fields of Late Stringless Green Refugee, evidence of plants wilted by Fusarium martii phaseoli was noted, but the percentage was small. The diseased plants were observed shortly after an irrigation with little, if any, spread after that time.

Rust (Uromyces appendiculatus). Rust caused no damage to the crops although a very small amount was found in the latter part of the season. Previous to August 15 no infection was noted but, with the relatively high humidity from the twelfth to the eighteenth of the same month, the disease developed to a slight extent on a few plantings of the Pinto bean, a variety which is extremely susceptible.

In 1927, bean rust caused large losses to the Pinto-bean crop, and in 1928 many fields were likewise destroyed by the fungus. In these two years there was considerable rain, a factor which is ideal for the development and spread of the rust organism. In 1929 and 1930 the rainfall was low, especially during the early part of the growing season, resulting in a small amount of rust. There appears to be a direct correlation between high humidities in the early part of the season and rust epidemics. This is likewise true with bacterial blight which is serious in Colorado only when the humidities are high during the early growing season.

Utah

The bean acreage which was surveyed in Utah was located in Cache, Box Elder, and Weber Counties.

Bacterial blight. In the fields visited, bacterial blight was of little consequence. In one field of the Late Stringless Green Refugee variety, a trace of stem girdle was found. In 1928 this phase of bacterial blight was reported by Linford (P.D.R. Sup. 59) as being very serious that year.

Anthracnose. Anthracnose was not observed.

Mosaic. The disease was most severe on the Late Stringless Green Refugee variety, averaging 10 to 20 per cent. In two small plantings which were poorly cared for, the disease was noted on about 80 per cent of the plants, stunting them severely with a decided reduction in yield. The fields which had from 10 to 20 per cent infection and which were well cared for suffered little in yield. Other varieties less susceptible to mosaic showed from 1 to 3 per cent infection with no reduction in yield.

Curly Top (virus). Even though the curly top disease was very widespread and caused much damage to the tomato crop in Utah, beans suffered little from it. It was noted in only a few fields, one having from 2 to 3 per cent, another from 5 to 8 per cent with a slight reduction in yield. It is believed that the variety which is planted very extensively here is more tolerant of the disease than are many other varieties.

Montana

The survey in Montana was conducted in Carbon and Yellowstone Counties where 56 bean fields were examined.

Bacterial blight. In the examination of Montana bean fields, 32 were practically free from infection, most of these being of the Refugee and the Great Northern varieties; thirteen fields showed a trace of the disease; and in eleven, the percentage of plants which showed the disease in varying amounts ranged from 5 to 50 per cent. The blight infection was not uniformly distributed throughout the fields, but was very spotted, the infected areas being from 2 feet to 2 rods in size.

According to the information received from the local seedsmen, no blight was in evidence ten days previous to the time the survey was conducted (August 16 and 17). Heavy dews were noted during that period, a condition which seldom occurs in that section at that time of the year. It is believed that this was the cause for the development and localized spread of the pathogen since no rain had been reported. Fortunately the infection took place at a time when many of the varieties were fairly mature with the result that pod and seed infection was not of serious consequence. There were, however, cases where the organism had attacked the pods, causing the seeds to become infected.

Anthracnose. As in 1928 and 1929, anthracnose was not found in any of the fields examined.

Mosaic. This disease was of no consequence in any of the varieties examined in Montana except the Refugee types and the Great Northern. Less infection was noted than in 1929 when it was estimated at from 10 to 25 per cent. The amount of infection on the Refugee varieties examined was from 5 to 10 per cent whereas in the Great Northern, which is an extremely susceptible variety, the percentage was smaller, ranging from a trace to 5 per cent. In only one field of the variety was the disease serious and here about 90 per cent infection was noted. It appeared that little secondary spread occurred, most of the infection noted being seed borne.

Root rots. The diseases caused by the root rot parasites were of no importance. However, in two fields of the Bountiful variety the disease was observed causing a little reduction in stand. These fields were heavily watered which apparently was the factor predisposing the plants to the malady.

Sclerotinia blight (S. libertiana). In a field of Full Measure beans grown in a region of high humidity, this disease was of serious consequence causing an appreciable reduction in stand and yield. The beans were planted on low land where the soil and air drainage was poor and the seepage from the surrounding land was very apparent. The plants made an excellent growth with no irrigation. The wilting of the plants was noticeable about the middle of August and in examining the field it was found that Sclerotinia was the cause of the trouble. The organism caused the typical slimy watery soft rot of the stem and pods, and sclerotia could be found on the pods as well as on the stem at some distance from the ground level.

Wyoming

The survey in Wyoming was limited to the Big Horn County where a large acreage of garden beans is grown. The same county was surveyed in 1929. Twenty crops in two of the important bean growing sections were examined.

Bacterial blight. This disease was of little importance in the Shell Creek section which is located about 15 miles northeast of Greybull along the Shell River. It is a comparatively small section and 11 crops were inspected. The amount of disease in these crops was very small, in most instances only a trace being found.

In the other section known as the Germania Bench, considerably more infection was observed. This section is not as well protected from the winds as is the Shell section. About August 10 rain and cloudy weather prevailed for about six days and it is believed that this was the cause for the spread and development of the organism in that section. In the nine crops which were examined, the amount of disease ranged from a trace to 70 per cent, averaging about 20 per cent. The lesions could be found on the pods, slightly reducing the yield. The secondary spread took place too late to cause an appreciable reduction in stand. In comparing the amount of disease this year with that of 1929, there was possibly slightly more in 1930.

Anthracnose. This disease was, as in 1928 and 1929, not observed.

Mosaic. Fewer fields of the varieties susceptible to mosaic were observed this year than in 1929. However, in the fields examined there appeared to be less of the disease than in 1929 when 20 to 25 per cent was noted. The past summer from 10 to 15 per cent infection was observed causing only a slight reduction in yield.

Root rots. These diseases were of no consequence in the fields examined. There was a trace noted in only one field with but a slight reduction in stand.

Idaho

The section which was surveyed was in the southern part of the state principally in Twin Falls County, however, portions of Jerome and Minidoka counties were included. This region comprises the principal bean growing area of the state. About seventy fields of the garden and field varieties which were considered as being representative of that region were examined. The largest acreage consists of the Great Northern variety, however, the garden bean types play an important role in the industry.

There is likewise a section in the northern part of the state where beans are grown extensively, but it was impossible for the writer to visit this region. The report here given are the findings in the southern portion of the state and any conclusions that may be formulated should not be interpreted for the entire state but only for that portion where the survey was conducted.

Bacterial blight. In a survey made in this section during the middle of July, the writer observed traces of this disease in two fields of garden varieties causing no reduction in stand or yield. The first report of bacterial blight in the state was made by E. F. Smith of the United States Department of Agriculture in 1914. His collections were made near Boise, Idaho, and the organism isolated was Bacterium phaseoli.

In field examinations made by the writer and other members of the United States Department of Agriculture in 1928 and 1929, the disease was not observed in any of the fields examined. The infection noted the past year was found on a comparatively small number of plants in the two fields mentioned above, both on the leaves and at the cotyledonary node of the stems indicating seed infection. It was impossible for the writer to learn the source of seed of these two particular fields, but it was believed that it originated in the east where bacterial blight is quite prevalent in certain years, From the typical "halo" like symptoms it produced it was assumed that Bacterium medicaginis var. phaseolicola was the parasite.

In a later field survey made about August 20 to 25, bacterial blight was found in three more fields located at some distance from the two fields in which the bacterial infection was noted in July. Again the spread of organism was not great, however, bacterial exudate was found on the stems and pods in small amounts. The source of the seed in two fields could not be traced, however, the third field was grown from seed produced in southern Idaho in 1929. Since this was the case, the organism must have been present that year, however, it apparently occurred in such small amounts that it was overlooked in the survey made that year. Isolations showed that Bacterium phaseoli was the causal organism.

It should not be understood that the amount of the disease observed was severe enough to cause any appreciable reduction in stand or yield. It is believed that the disease will not be serious or widespread in that region because of the low humidities which prevail in that part of the state during the growing season. Since the disease was found in only five of the seventy fields examined, and then only in very small amounts, it can plainly be seen that it was not of serious consequence. From the facts that eastern grown seed which, without doubt, has carried varied amounts of the bacterial organism from time to time has been planted in Idaho for many years, and that the disease has been recorded only once previously, it can be seen that the spread and development of the organism is very limited in the southern part of the state and will probably not be of a serious nature.

In the experimental bean trial grounds located in Twin Falls County, a small plot of Wisconsin 1929 grown seed was planted. The bacterial blight lesions were not noticeable until about the middle of July at which time a small percentage of plants died, and upon examination the stem girdle lesion was noted indicating seed infection. By the middle of August the percentage had increased. However, there was no secondary spread observed. The plants remaining were free from blight infection.

Anthracnose. This disease was not observed in any of the plantings examined.

Mosaic. Bean mosaic was again a factor of importance in the bean growing section of southern Idaho. It was noted that in the section west of Twin Falls township, the disease was widespread in many fields of the susceptible varieties. The Great Northern bean, which is grown more extensively than any other variety, is one of these. The infection in a number of fields in that vicinity ranged from 35 to 85 per cent in many instances causing a decided reduction in yield where the infection was severe and of primary origin. Plants infected later appeared to produce a normal crop. Varieties less susceptible than the Great Northern bean averaged from 4 to 7 per cent infection, the greatest amount being found in the rows near the edges of the fields, either adjacent to an irrigation ditch or a fence row where weeds were found to be growing abundantly. In a number of instances 15 to 20 per cent of infection was found in the outermost rows whereas only a trace was observed in the center of the field.

In the sections located east of Twin Falls township.and also in Jerome County and the southern part of Minidoka County, mosaic was not observed to be as widespread as in the section mentioned above. In the examination of fields of the Great Northern variety during the middle of July the amount of mosaic ranged from a trace to 3 per cent, this amount slightly increasing during the latter part of the season.

In the experimental trial plots, the Refugee varieties, which are equally as susceptible to the disease as is the Great Northern variety, showed infections, both primary and secondary, varying from 95 to 100 per cent. Many of the seedling infected plants were decidedly stunted.

Root rots. Only a trace of these diseases were noted and were of little consequence causing no appreciable damage.

Curly top (virus). (Information furnished by Charles F. Henderson, see footnote, p. 228). From July 16 to 22, a survey was conducted in the Great Northern bean fields of southern Idaho for the purpose of correlating the distribution of curly top with the west to east dispersal of the beet leafhopper, Eutettix tenellus (Baker). On August 14 to 18, a second survey was made covering the same fields. No material increase of disease was observed in the early planted beans, except in fields adjacent to other crops from which local movements might easily have occurred.

In estimating the percentages included in the following table, plants having obvious curly top symptoms were listed as diseased without reference to the severity in individual plants. Thus, the data here presented give only an indication of the relative distribution of curly top over the area, rather than the actual loss caused by the disease.

North Side of Snake River

District	Number fields	Average per cent
Jerome	8	35.6
Eden-Hazelton	6	16.1
Burley (north side)	2	6.0
Rupert	5	4.0

South Side of Snake River

District	Number fields	Average per cent
Filer	6	44.2
Twin Falls	9	16.3
Kimberly-Hansen	6	13.9
Murtaugh	5	4.7
Burley (south side)	5	2.4

In some fields located outside of the recognized Great Northern bean growing section and in close proximity to the breeding areas of the beet leafhopper, the disease ran as high as 95 per cent. Certain individual fields within the usual white bean section were severely affected with resulting loss in yields. In spite of these comparatively high percentages of curly top the bean yields throughout the Great Northern bean growing territory in southern Idaho taken as a whole were quite satisfactory, especially where heavy seeding was practiced.

California

The bean growing territory which was surveyed in the state was located in Sacramento, Santa Clara, San Joaquin, Monterey, Santa Barbara, Los Angeles, San Diego and Orange Counties. Because of insufficient time and the large territory covered, the survey of the garden and field bean acreage was not as detailed as it was in the above mentioned states. Most of the garden bean varieties are not grown as extensively in California as they are in the Intermountain States, hence examination of these varieties were limited to small acreages and also to trial plantings located in many of the counties visited. It is believed, however, that since a representative acreage of the Henderson Bush lima bean crop was examined in each of the important bean growing sections mentioned above, a fairly complete picture of the condition of this crop will be recorded.

Bacterial blights and anthracnose. These diseases were not observed in any of the fields of lima, garden or field beans visited in the counties mentioned. As far as the writer can learn, bacterial blight has never been reported from the bean growing sections of the state. Anthracnose has been found by previous investigators but it is very rare and unimportant in the state.

Mosaic. A slight amount of mosaic was observed in fields of the Late Stringless Green Refugee variety in Sacramento, Santa Clara, and

Monterey Counties. The spread of the virus to any appreciable extent was not observed, and the disease noted was believed to have been of seed origin. The only decided stunting which was seen was in a field grown in the Sacramento territory where conditions were apparently favorable for the development of the disease. In Santa Clara and Monterey Counties, infected plants could be noted, but their growth did not appear to be impaired by the presence of the virus.

In only single fields of the Henderson Bush lima bean was a trace of this disease observed causing no reduction in yield.

Powdery mildew (Erysiphe polygoni). This disease was seen in three fields of garden beans in Santa Clara County. In one field it was very widespread, causing a stunting and premature maturation of many plants with a small reduction in yield. A trace of the disease was also noted in two fields of the Black-Eye cowpea in Orange County but without damage to the crop.

Rust. This disease was of no importance in the principal seed bean growing sections, however a trace was noted in Santa Barbara and slightly more in San Diego County in the vicinity of Chula Vista. Because of the high humidities in this latter section, which is in close proximity to the coast, bean rust often becomes a serious menace to the growers of the Kentucky Wonder bean, a variety very susceptible to the disease. In a number of fields of the Black-Eye cowpea in Orange County the disease was also observed however no damage resulted.

Root Rots. The root rot diseases caused by Fusarium sp. and Rhizoctonia were again noted as in 1929 in many fields examined, causing no appreciable reduction in stand or yield.

Nematode Injury (Caconema radicicola). In certain plantings of the Henderson Bush lima bean crop in Los Angeles County, nematode injury was found to be widespread causing a decided reduction in stand in a few fields observed in that vicinity.

Summary of 1930

The bacterial blights were not found in California, a trace in five fields in Idaho, sparingly in Utah, Colorado and Wyoming, and slightly more abundant in Montana.

Anthracnose was not observed in any of the commercial acreages in the states visited. A trace was noted in the trial plots at Greeley, Colorado, where eastern grown seed infected with the disease was planted.

Mosaic was again widespread as it was in 1929. It was very prevalent in southern Idaho, slightly less in Colorado and Utah, and still less in Montana, Wyoming and California.

Curly top of beans was widespread and destructive in certain sections of southern Idaho. The amount of the disease could be correlated with the dispersal of the beet leafhopper. In all of the other states it was of no consequence.

The root rots were found in small amounts in all the states surveyed causing little damage.

Powdery mildew was seen only in California where it caused very little damage. In one instance it caused a premature maturation of the plants.

Rust was found in Colorado and Southern California but was of minor importance. In Colorado a trace of infection was observed after August 15 but no damage resulted.

Nematode injury was observed in Los Angeles County, California, causing a decided reduction in stand in a number of plantings.

N O T I C E

To Representatives of the Division of Foreign Plant Quarantines, Plant Quarantine and Control Administration.

Beginning with this issue the Plant Disease Reporter will, by request of Mr. Sasscer, be sent to the offices where representatives of the Division of Foreign Plant Quarantines are located.

Notes which relate particularly to the work of the Plant Quarantine and Control Administration will be assembled under the general heading "Plant Quarantine Notes" and prepared by Mr. H. S. Dean.

It is hoped that members of this staff will find something of interest in other sections of the Reporter as well.

TEXAS FUNGI

I. The following list is of a collection of fungi and a few bacteria made during 1930 by B. F. Dana, S. E. Wolf, and Luther Powers, mostly in the vicinity of Temple, Texas. Except where noted the determinations of the rusts and smuts are by R. W. Davidson, and of most of the other fungi by G. Hamilton Martin, in the Office of Mycology and Disease Survey.

It will be noted that a number of these records constitute a first report to this Office, either for Texas or for the United States. It is hoped that the publication of this list will stimulate similar collections in other states.

Smuts

Ustilago avenae (Pers.) Jens.
On Avena sativa. 3 miles south of Temple, May 22.

Ustilago cynodontis P. Henn.
On Cynodon dactylon. Temple, June 13.
This smut has been reported as occurring in California, and B. C. Tharp collected it at Austin, Texas, in 1914.

Ustilago hordei (Pers.) Kell. & Sw. and U. nuda (Jens.) Kell. & Sw.
On Hordeum vulgare. Temple, June 1. Det. A. G. Johnson.

Ustilago utriculosa (Nees) Tul.
On Persicaria sp. One-half mile east of Little River, Nov. 4.

Sphacelotheca occidentalis (Seym.) Clint.
On Andropogon furcatus. 3 miles south of Temple, June 18.
This is the first report of this fungus from Texas. Two specimens were received with this collection.

Sphacelotheca sorghi (Lk.) Clint.
On Holcus halepensis. Temple, May 30.

Sorosporium provinciale (Ell. & Gall.) Clint.
On Andropogon sp. 3 miles south of Temple, June 5.
Previously reported from Missouri and Nebraska on A. furcatus.

Rusts

Coleosporium carneum (Bosc.) H. S. Jack.
On Vernonia sp. 3 miles east of Salada, June 23.

Melampsora lini (Schw.) Desm. II
On Linum sp. Bell Co., Mar. 30.

Phakopsora crotonis (Burr.) Arth. II and III
On Croton texensis. Temple, Oct. 1

Endophyllum tuberculatum (E. O. Kell.) Arth. & Fromme
On Callirhoe involucrata. Prairie Dell, Mar. 26.

Ravenelia arizonica Ell. & Ev. II
On Prosopis glandulosa. 4 miles east of Salada, June 1.
Galls probably formed by this rust, but there also seems to be a trace of Neoravenelia holwayi on the leaves.

Tranzschelia cohaesa (Long) Arth. O and I
On Anemone decapetala. Bell Co., Mar. 30.

Gymnoconia interstitialis (Schl.) Lagh.
On Rubus trivialis. Temple, Mar. 7.

Gymnosporangium germinale (Schw.) Kern O and I
On Crataegus sp. Rogers Hill, Bell Co., May 14.

Uromyces bicolor Ellis III
On Allium helleri. Little River, Apr. 10.

Uromyces caladii (Schw.) Farl. I
On Muricauda dracontium. Bell Co., Apr.

Uromyces dictyosperma Ell. & Ev. I and III
On Tithymalus sp. Brazos Co., Mar. 27.

Uromyces hordeinus (Arth.) Barth. I
On Nothoscordum bivalve. 6 miles south of Temple, Nov. 5.

Uromyces houstoniatus (Schw.) Sheldon I
On Houstonia sp. Prairie Dell, May 26.

Uromyces lespedezae-procumbentis (Schw.) Arth. III
On Lespedeza sp. 5 miles southeast of Temple, June 22.

Uromyces medicaginis Pass. II and III
On Medicago sativa. Temple, Oct. 17.

Uromyces plumbarius Peck I, II, III
On Gaura sp. Heidenheim, Mar. 24.

Uromyces proeminens (DC.) Pass. II and III
On Poinsettia dentata, Chamaesyce malaca, Chamaesyce serpens.

Uromyces punctatus Schröt. II and III
On Astragalus nuttallianus. Temple.

Uromyces spermacoces (Schw.) Curtis III
On Diodia teres. Troup, Oct. 17.

Uromyces zygadeni Peck II and III
On Zygadenus sp. Prairie Dell, Mar. 26.

Puccinia andropogonis Schw. III
On Andropogon furcatus. Temple, Nov. 5.

Puccinia graminis Pers.
On Hordeum vulgare, Triticum aestivum.

Puccinia helianthi Schw. II
On Helianthus annuus. Rogers Hill, Pagosa, May 14.

Puccinia hieracii (Schum.) H. Mart.
On Pyrrhopappus multicaulis. Temple, May 9.

Puccinia rhamni (Pers.) Wettst. II and III
On Avena sativa.

Puccinia ruelliae (Berk. & Br.) Lagh. II and III
On Ruellia tuberosa. 3 miles south of Temple, Oct. 24.

Puccinia sorghi Schw. II
On Zea mays. Temple.

Puccinia triticina Eriks.
On Triticum aestivum. 3 miles south of Temple, May 24.
Determination verified by A. G. Johnson.

Puccinia tubulosa (Pat. & Gaill.) Arth. I
On Solanum elaeagnifolium. Westlaco, May 3.

Puccinia tuyutense Speg. II
On Evolvulus sericeus. One-fourth mile west of Little River, July.

Puccinia windsoriae Schw. III
On Tridens seslerioides. 2 miles west of Little River, Oct. 8.

Puccinia xanthii Schw. III
On Xanthium sp. July 1.

Other Fungi

Albugo candida (Pers. ex Lév.) O. Kuntze
On Lepidium austrinum. Temple, Apr. Det. R. W. Davidson.

Albugo platensis (Speg.) Swingle
On Boerhaavia erecta. 2 miles south of Little River, June 11.
Det. R. W. Davidson.

Cercospora cornicola Tracy & Earle
On Cornus asperifolia. Salada. June 1.
First report for the United States.

Cerebella andropogonis Ces.
On Andropogon furcatus and Amphilophis torreyanus.
This is a first report of this fungus occurring on these hosts. The species of this genus resemble the smuts and may easily be confused with them. Det. R. W. Davidson.

Claviceps purpurea (Fr.) Tul.
On Amphilophis torreyanus.
The sclerotia of this fungus occurred on the same specimens infected with the Cerebella andropogonis, and also seems to be a first report for this host. Det. R. W. Davidson.

Colletotrichum graminicolum (Ces.) Wils.
On Bromus secalinus, Temple, May 22.
Hordeum sp., Temple, May 9.
Sporobolus sp., 5 miles north of Holland, Sept. 16.
The reports on Bromus secalinus and Hordeum sp. are the first for Texas, while the one on Sporobolus sp. is the first for the United States.
On Tridens seslerioides, associated with a Mycosphaerella sp.
Det. R. W. Davidson.

Cylindrosporium tradescantiae Ell. & Kell.
On Tradescantia reflexa. Temple, June 9.
First report for the United States.

Erysiphe graminis DC.
On Hordeum vulgare. Temple, May 9. Det. R. W. Davidson.

Gloeosporium nervisequum (Fckl.) Sacc.
On Liquidambar styraciflua. Angelina Co., Oct. 17.
First report for Texas.

Glomerella fusarioides Edg.
On Acerates viridiflora. Temple, May 22.
First report for the United States.

Glomerella gossypii (Southw.) Edg.
On Gossypium hirsutum. Nacadoches, Oct. 17.

Graphiola phoenicis (Moug.) Poit.
On ornamental palm. Westlaco, Aug. 23.

Guignardia bidwellii (Ell.) Viala & Rav.
On Vitis sp. 7 miles south of Temple, Sept. 27.

Helminthosporium sp.
On Chaetochloa macrostachya. San Antonio, Aug. 30.
First report for the United States.

Helminthosporium sativum Pam., King, & Bakke
On Hordeum vulgare. May 21.

Kellermannia yuccogena Ell. & Kell.
On Yucca sp. Burnett Co., Apr. 16.

Leptosphaeria spectabilis Niessl.
On Elymus sp. 3 miles south of Temple, May 5.
First report for the United States.

Ovularia obliqua (Cke.) Ud.
On Rumex altissimus. Temple, May 21.

Peronospora parasitica (Pers.) de By.
On Lepidium austrinum. Temple, Mar. 24.
First report for the United States.

Phleospora adjusta Heald & Wolf
On Clematis sp. 4 miles east of Salada, June 1.

Phyllachora graminis (Pers.) Fckl.
On Rhombolytrum albescens. 5 miles south of Temple, Nov. 5.
First report for the United States.
On Sporobolus sp. 4 miles west of Temple, Oct. 8.
On Tridens seslerioides (Triodia flava). Holland, Nov. 4.
First report for the United States.

Phyllachora lespedezae (S.) Sacc.
On Lespedeza sp. Near Bird Creek, southwest of Temple, June 15.
First report for Texas.

Rhysotheca geranii Pk.
On Geranium texanum. Temple, Mar. 24; Bell Co., Mar. 30.
First report for Texas.

Rhytisma curtisii Berk. & Rav.
On Ilex decidua. 6 miles northwest of Belton, Aug. 10.
First report for the United States.

Septoria nodorum Berk.
On Triticum aestivum. Temple, May 22.
First report for Texas.

Sphaerella acaciae Cke. & Hark.
On Acacia sp. 6 miles southeast of Belton, June 23.
First report for the United States.

Tuberculina persicina (Ditm. ex Fr.) Sacc.
On Uromyces proeminens (DC.) Pass. I on Chamaesyce malaca.
Det. R. W. Davidson.

Bacteria

Bacterium sp.
On Holcus halepensis. Temple, May 30.
On H. sudanensis. Temple, May 31.
Det. B. F. Dana.

Bacterium translucens Jones, Johnson, & Reddy.
On Hordeum vulgare.
Det. A. G. Johnson.

II. A small collection of fungi made by J. J. Taubenhaus at College Station, Texas, and determined by G. Hamilton Martin, is listed below. All of these seem to be first reports either for the United States or for Texas.

Cercospora pulvinula Cke. & Ell.
On Ilex opaca. Aug. First report for Texas.

Cercospora zizyphi (Thuem.) Sacc.
On Zizyphus jujuba. Aug.
First report for the United States.

Coniothyrium fuckelii f. zizyphi Sacc.
On Zizyphus jujuba. Aug.
First report for the United States.

Gloeosporium aquifolii Penz. & Sacc.
On Ilex aquifolium. Oct. 10.
First report for the United States.

Helminthosporium sp.
On Tetragonia expansa. Aug.
First report for the United States.

Phyllosticta opaca Ell. & Ev.
On Ilex opaca. Aug.
First report for Texas.

CRANBERRY FALSE BLOSSOM FOUND FOR FIRST TIME IN LONG ISLAND

The occurrence on Long Island of the cranberry virus disease, false blossom, is reported by R. B. Wilcox as follows (Dept. 25):

> "During the last two days, in company with Mr. J. L. Kelley of the Massachusetts Cranberry Experiment Station, and Mr. Clement of the New York Bureau of Agriculture and Markets, I have made a careful survey of the cultivated cranberry areas of Long Island. I regret the necessity of reporting the occurrence of false blossom on Long Island.

"It was found at two places. On the largest and best managed bogs on Long Island eight isolated plants or very small patches of the disease were found, and also, a small bog at Calverton was found to be infected.

"This is the first report of false blossom on Long Island. Previous surveys have failed to show the presence of the disease, although the small amount of the infection suggests that it may well have been missed on the previous surveys."

PLANT QUARANTINE NOTES

H. S. Dean

Port interceptions:

Commercial shipments of chinkerinchee flowers (Ornithogalum thyrsoides) originating in the Union of South Africa have been found on inspection by the Plant Quarantine and Control Administration, at the ports of New York, Philadelphia and Chicago, to be commonly infected with one or more fungi. The most common of these has been found to be the rust Puccinia ornithogali-thyrsoides Diet. This fungus occurs in abundance on the stems and floral parts of the host, the telia appearing on slightly discolored spots 1-4mm. long. They may remain separate or coalesce to form black "Phyllachora-like" sori which are covered by the epidermis.

Heterosporium ornithogali (Klot.) Cke. also has been found rather commonly on this material and does not appear to have been previously reported on this host. It causes elongate light gray spots with dark brown borders on which the light brown conidiophores may be seen by the aid of a hand lens. The conidia vary considerably, ranging from 10-45u long by 8-12u in width, and are from one to five celled.

A smut, Ustilago ornithogali (Schw. ex Kunze) Kuhn., has been found on one interception of O. thyrsoides constituting the first report of the fungus on this host. It produces ovoid, dark brown slightly raised spots 4-10 mm. long. In the one specimen found the sori remain covered by the epidermis.

So far as is known the rust and smut do not occur in North America, but the Heterosporium has been reported from Washington on Ornithogalum sp. and has been collected in Pennsylvania on O. umbellatum. (Ross W. Davidson.)

Uromyces appendiculatus on string beans from Spain (in ship's stores), intercepted at Philadelphia, Pa., November 14, 1930. Det.: Mr. R. W. Davidson.

Colletotrichum lindemuthianum on string beans from the Canal Zone, (in ship's stores), intercepted at Philadelphia, Pa., April 25, 1930, and from Camargo, Mexico (in baggage), intercepted at Rio Grande City, Texas, November 19, 1930; also on Lima bean pods collected near San Juan, Porto Rico, November 19, 1930. Det.: Mr. H. S. Dean.

Penicillium gladioli on Scilla bulbs from Holland (in cargo), intercepted at Philadelphia, Pa., October 15, 1930. Det.: Miss L. McCulloch.

Colletotrichum graminicolum on Anthoxanthum odoratum (Host det.: Prof. D. Lumsden) from Poland (in mail), intercepted at Philadelphia, Pa., September 18, 1930. Det.: Mr. G. H. Martin.

Puccinia buxi on Boxwood cuttings from Ireland (in mail), intercepted at Philadelphia, Pa., November 19, 1930. Det.: Mr. R. W. Davidson.

Uromyces fabae on green pea pods from Italy (in ship's stores), intercepted at Philadelphia, Pa., May 5, 1930. Det.: Mr. R. W. Davidson.

Coniothyrium fuckelii on Rosa manetti stock from England (twice) and Ireland (in cargo), intercepted at Philadelphia, Pa., November 20 and 25, 1930. Det.: Mr. G. H. Martin.

Alternaria radicina on carrots from Sweden (in ship's stores) intercepted at Philadelphia, Pa., November 17, 1930. Det.: Mr. J. A. Stevenson. Also on carrots from Holland (in ship's stores), intercepted at Charleston, S. C., November 23, 1930. Det.: Mr. H. S. Dean.

Claviceps purpurea on Festuca spadicea from Pyrenees Mts., Canfranc, Spain. Intercepted at Washington, D. C., November 10, 1930. Det.: Mr. D. P. Limber.

Elsinoe canavaliae has been intercepted many times on Lima bean pods from Cuba (in cargo) at New York City during the period from November 1 to December 15, 1930. Det.: Mr. H. S. Dean.

Tylenchus dipsaci in potato from Holland (in ship's stores), intercepted at Charleston, S. C., November 23, 1930. Det.: Dr. G. Steiner.

Aphelenchus avenae in carrots from Sweden (in ship's stores), intercepted at Philadelphia, Pa., November 17, 1930. Det.: Dr. G. Steiner.

Aphelenchus parietinus and A. avenae in potato from Sweden (in ship's stores), intercepted at Philadelphia, Pa., November 8, 1930. This same tuber contained a very interesting unpublished nema previously found only in the U. S. on an altogether different host. Det.: Dr. G. Steiner.

Tylenchus pratensis in Lily-of-the-valley pips (twice) from Germany (in cargo), intercepted at New York City, November 25 and 26, 1930. Det.: Dr. G. Steiner.

Specimens collected during the field inspection of plant material imported under special permit:

Diplodia euonymi on Euonymus europaea atropurpurea imported from Holland. Collected at Yonkers, N. Y., July 10, 1930 by Mr. W. S. Fields. Det.: Mr. G. H. Martin.

Sphaeropsis malorum on Cotoneaster franchetti cinerascens imported from England. Collected at Essex Fells, N. H., October 11, 1930 by Mr. W. S. Fields. Det.: Mr. G. H. Martin.

Septoria divaricata on Phlox vars. Karl Foerster and Prof. Went imported from Holland. Collected at Ossining, N. Y., August 27, 1930 by Mr. W. S. Fields. Det.: Mr. G. H. Martin.

Colletotrichum griseum on Euonymus verrucosus imported from Ireland and Germany. Collected by Mr. W. S. Fields at Essex Fells, N. J., October 10, 1930 and at Yonkers, N. Y., July 10, 1930, respectively. Det.: Mr. G. H. Martin.

Gloeosporium aquifolii on Ilex aquifolium Handsworth New Silver imported from England. Collected at Essex Fells, N. J., October 16, 1930 by Mr. W. S. Fields. Det.: Mr. G. H. Martin.

Phoma syringae and Cytospora ambiens on Syringa var. Leon Gambetta imported from France. Collected at Merrill, Wisc., September 28, 1930 by Mr. H. W. Hecker. Det.: Mr. G. H. Martin.

Specimen received through the Office of Domestic Plant Quarantines:

Caconema radicicola in Clematis roots collected at West Hempstead, L. I., November 28, 1930 by Mr. R. L. Clement. Det.: Mr. H. S. Dean.

CORRECTIONS

Vol. 14, No. 20, Oct. 15, 1930, Insert after Page 209.

For the statement on Ozonium root rot (Phymatotrichum omnivorum), attributed to J. B. Norton, substitute the following paragraph from his letter of October 22, 1930:

> "On the California side of the Imperial Valley we have no record of the presence of Ozonium root rot west of the sand hills. As far as we know it has never been reported from the Imperial Valley by anyone familiar with the disease. It is well known that it occurs in the basin of the Colorado River and extends near the border in the Imperial Valley section of Lower California."

Supplement 75, Page 54, The Plant Disease Reporter.

In the reference to Bacterial Leaf Speck, delete the following sentence:

"The bacterial character of the disease was confirmed by Miss Mary K. Bryan."

NOTICE

It is planned to resume regular issues of the Plant Disease Reporter on April 1, approximately. During the interval the Reporter will appear irregularly at such times as sufficient material of interest accumulates to warrant an issue.